

56-7-41/66

A Note Concerning the Group of the Multiplicative  
Renormalization in the Quantum Theory of the Field.

the gradient invariance in quantum electrodynamics), then  
some of the constants occurring in the above mentioned  
four relations can be in connection with each other. The  
renormalization group, in fact, expresses a peculiar  
"automodel-like" behavior of SCHWINGER'S equations.  
Analogous contemplations can be carried out also in  
theories with other interaction LAGRANGIANS.  
(No Illustrations)

ASSOCIATION: Moscow State University.  
(Moskovskiy gosudarstvennyy universitet.- Russian)  
PRESENTED BY: -  
SUBMITTED: 11.1. 1957  
AVAILABLE: Library of Congress.

CARD 3/3

AUTHOR  
TITLE

PERIODICAL

ABSTRACT

SHIRKOV, D.V.

BOGOLYUBOV N.N., Member of the Academy, SHIRKOV D.V. PA - 3135  
Dispersion Relations For the COMPTON scattering On Nucleons  
(Dispersionnyye sootnosheniya dlya komptonovskogo rasseyaniya na nukle-  
nakh -Russian)  
Doklady Akademii Nauk SSSR, 1957, Vol 111, Nr 3, pp 529-532 (U.S.S.R.)  
Received 6/1957 Reviewed 7/1957

For the analysis of the amplitude  $f$  of COMPTON scattering the authors con-  
fine themselves to the examination of the main term proportional to  $e^2$ .  
They therefore put  $e = 0$  in the expressions for the corresponding vari-  
ation derivations, on which occasion only strong interactions are taken in-  
to account. The dispersion relations for the scattering of photons by nuc-  
leons can be determined by the same method by which N.N.BOGOLYUBOV deter-  
mined the dispersion relations for the scattering of pions by nucleons.  
At first an ansatz for the amplitude of COMPTON scattering is written down.  
A function occurring in this ansatz is the impulse image of the "causal"  
matrix element. Besides, "retarded" and "advanced" matrix elements are in-  
troduced. For the imaginary case  $\lambda^2 = E^2 - \vec{p}^2 = T, T < -\vec{p}^2$ , functions  $S + i$   
can be defined which are analytical (with the exception of intersection  
lines and poles on the real axis) within the entire plane of the complex  
variables  $E$ . The intersection lines and poles are determined according to  
a complete function system by development of the HAMILTONIAN of the meson-  
and nucleon field. The amplitude of COMPTON scattering in infinity is  
assumed to have a pole of, at the most, first order.

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Dispersion Relations For the COMPTON scattering On Nucleons. PA . 3134

Also the exclusion of the unobservable domain of the negative energies is discussed in short. The dispersion relations obtained here have the following important properties: Not only on the occasion of scattering in a forward direction, but also for a finite interval of recoil impulse these dispersion relations contain no unobservable domain of energy.  
(1 illustration)

ASSOCIATION United Institute for Nuclear Research  
PRESENTED BY  
SUBMITTED 29.3.1956  
AVAILABLE Library of Congress  
Card 2/2

BOGOLYUBOV, Nikolay Nikolayevich; TOLLMACHEV, Vladimir Veniaminovich;  
SHIRKOV, Dmitriy Vasil'yevich; GUROV, K.P., red.isd-va; POLENOVA,  
T.P., tekhn.red.

[New method in the theory of superconductivity] Novyi metod v teorii  
sverkhprovodimosti. Moskva, Izd-vo Akad.nauk SSSR, 1958. 127 p.  
(Superconductivity) (MIRA 11:6)

BOGOLYUBOV, Nikolay Nikolayevich, MEDVEDEV, Boris Valentinovich, POLIVANOV,  
Mikhail Konstantinovich.; SHIRKOV, D.V., red.; TUMARKINA, N.A., tekhn. red.

[Problems in the theory of dispersion relations] Voprosy teorii  
dispersionnykh sootnoshenii. Moskva, Gos. izd-vo fiziko-matematicheskoi  
lit-ry, 1958. 202 p. (MIRA 11:11)

(Field theory)

89 -1-4/18

AUTHOR: Shirkov, D.V.

TITLE: The "Synthetic Kernel"-Method Applied in the Case of Neutron Diffusion in a Medium Containing Hydrogen (Metod sinteticheskogo yadra dlya zadach diffuzii neytronov v vodorodsoderzhashchey srede).

PERIODICAL: Physics and Thermotechniques of Reactors (Fizika i teplotekhnika reaktorov), Supplement Nr 1 to Atomnaya energiya, 1958, (USSR)

ABSTRACT: The physical idea of the suggested method consists in the perturbation of the correlation between the deflection of neutrons and their change of energy in the individual act of scattering on a medium containing hydrogen, in which case the approximated static correlation for a large number of collisions is conserved. In this manner it is possible to derive an approximation-diffusion equation for a medium containing hydrogen. The equation is similar to Peyerl's equation and is suited for the direct numerical computation of concrete problems. In the following chapters the following problems are theoretically dealt with:  
1.) The synthetic transformation of the indicatrix in elastic slowing-down.

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The "Synthetic Kernel"-Method Applied in the Case of Neutron  
Diffusion in a Medium Containing Hydrogen

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- 2.) The generalized Peyerl's equation, which describes slowing-down.  
There are 3 references, 2 of which are Slavic.

AVAILABLE: Library of Congress

Card 2/2

1. Peyerl's equation 2. Neutrons-Scattering-Mathematical analysis

16(1)

AUTHORS: Ginzburg, I.F., and Shirkov, D.V.

SOV/155-58-2-32/47

TITLE: Asymptotic Behavior of Higher Green Functions (Asimptoticheskoye povedeniye vysshikh funktsiy Grina)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1958, Nr 2, pp 143-151 (USSR)

ABSTRACT: The asymptotic behavior of higher Green's functions for large values of the scalar impulse arguments, recently investigated by Konuma and Umezawa [Ref 1], is treated by the authors with the aid of the method of the group of renormalization [Ref 2,3,4,5]. The ultraviolet impulse asymptotic of higher Green's functions is determined in two steps. At first the Lie equations are established and solved for the invariant charges which characterize the given variant of the field theory. Then the Lie equation is solved for the impulse asymptotic of the considered Green's function. The method is suitable for the investigation of the Green's functions of real physical scattering processes. The authors thank V.L. Berezinskiy for the valuable discussion. There are 3 figures, and 6 references, 3 of which are Soviet, 1 American, and 2 Italian.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (United Institute of Nuclear Research)  
~~Card 1/2~~



24(5)

SOV/20-122-1-11/44

AUTHORS: Mayyer, M. E., Shirkov, D. V.

TITLE: On the Two-Dimensional Model Developed by Thirring (O dvukhmernoy modeli Tirringa)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 1, pp 45-47 (USSR)

ABSTRACT: According to Thirring (Ref 1), the non-linear theory of the spinor field with the Lagrangian of interaction

$$\mathcal{L}(x) = g: \bar{\psi}(x) \sigma^n \psi(x) \bar{\psi}(x) \sigma^n \psi(x):$$

is investigated in a two-dimensional space. Here  $\sigma^0 = I$ ;

$\sigma^1, \sigma^2, \sigma^3$  denote the usual Pauli matrices of the second rank, and the summation in the above-given Lagrangian is

defined as follows:  $\sigma^n \times \sigma^n = I \times I - \sigma^1 \times \sigma^1 - \sigma^2 \times \sigma^2 - \sigma^3 \times \sigma^3$ .

The above-given Lagrangian is the only combination that is symmetric with respect to a transposition of two anticommutating operators  $\psi$  and (or) two  $\bar{\psi}$ . The authors investigate that element of the S-matrix which corresponds to the scattering of 2  $\psi$ -particles of zero mass; this element may

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On the Two-Dimensional Model Developed by Thirring

SOV/20-122-1-11/44

be written down in the form

$$S = (ig/4\pi^2) \int \bar{\psi}_\alpha(p') \psi_\beta(q) \bar{\psi}_\gamma(q') \psi_\delta(p) \delta(p' + q' - p - q) \cdot \Gamma_{\alpha\beta,\gamma\delta}(p', q', p, q) d^2 p' d^2 p d^2 q' d^2 q$$

where the function  $\Gamma$  obviously is antisymmetric and summation is carried out with respect to the dummy (nemo) indices. In the second order of the perturbation theory, the following expression is found for  $\Gamma$ :

$$- \frac{2g}{\pi} (\sigma_{\alpha\beta}^n \times \sigma_{\gamma\delta}^n) \ln \frac{P^2}{Q^2} - \frac{g}{\pi} \frac{\{\hat{P}_{\alpha\beta} \times \hat{P}_{\gamma\delta} + \hat{P}_{\alpha\delta} \times \hat{P}_{\gamma\beta}\}}{P^2} C$$

There is  $P = (p' - p)/2$ ,  $Q = (p + q)/2$ , and  $C$  denotes a constant which contains an infrared divergence. This divergence may be eliminated from the normalizing considerations for scattering processes of real particles. Moreover, the last given expression does not contain ultraviolet divergences. The final expression for  $\Gamma_{\alpha\beta,\gamma\delta}$  is given explicitly. The authors then

try to improve the approximation properties of this expression for  $\Gamma_{\alpha\beta,\gamma\delta}$  according to the method of the renormalization

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On the Two-Dimensional Model Developed by Thirring

SOV/20-122-1-11/44

group. The renormalization group for this problem has the same structure as the renormalization group for a certain variant of the non-linear meson theory. The corresponding functional equations are given explicitly. The function  $\varphi$  which figures in these equations denotes an invariant charge, and there is  $\varphi(x, g) = 1$ . The charge is not renormalized in the linear (with respect to  $g$ ) approximation. All things considered, this is a consequence of the fact that there is no ultraviolet divergence. The authors then deduce an improved expression for  $T$  for the scattering of 2 real particles. In a certain degree, the formula deduced in this way is exact in the limit of small  $g$ , and it is very similar to a result of Thirring for the limit case of small  $g = \lambda$ . The authors thank V. Ye. Thirring for very useful remarks, and also N. N. Bogolyubov and B. V. Medvedev for discussions. There are 4 references, 2 of which are Soviet.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (United Institute of Nuclear Research); Matematicheskiy institut im. V. A. Steklova Akademii nauk SSSR (Mathematical Institute imeni V. A. Steklov AS USSR)

Card 3/4

SHIRKOV, D. V. (Dubna)

"Theoretical Investigations of Dispersion Relations."

Nuclear  
report presented at the Intl. Conference on High Energy/Physics, Kiev, 15-25 July 1959.  
(at the session on Theoretical Investigations)

SOV/56-36-2-39/63

24(3)

AUTHOR:

Shirkov, D. V.

TITLE:

On the Equation of Compensation in the Theory of Superconductivity (Ob uravnenii kompensatsii v teorii sverkhprovodimosti)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 2, pp 607 - 612 (USSR)

ABSTRACT:

The author deduces a connection between the matrix elements of the variation derivatives of the scattering matrix and of the energy operator. The energy characteristics of a many-body system can be expressed by the total S-matrix

$$S = S_{-\infty}^{\infty} = T \left( \exp \left\{ -i \int_{-\infty}^{\infty} H_{\text{int}}(t) dt \right\} \right).$$

This method is used as the basis of the considerations discussed in this paper. The kernel  $Q(k, k')$  of the integral equation is expressed by the vacuum matrix elements of the variation derivatives of  $S$ , i. e. by ordinary Green (Grin) functions. The explicit expressions for these Green functions

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On the Equation of Compensation in the Theory of Superconductivity

SOV/56-36-2-39/63

can be found according to the method of approximate second quantization. The second part of the present paper deals with the connection of  $S$  and  $R$  and of their variation derivatives. ( $R$  denotes the energy operator). Formulae of the discussed type can be found also for the commutators of the quantities  $S, R$  with the operators of particle production and particle annihilation and, therefore, also for the variation derivatives of  $S$  and  $R$  with respect to these operators. In the third part of the present paper, the transformations of the kernel  $Q$  of the compensation equation are discussed. The kernel  $Q$  can be represented as a sum of two terms:  
 $Q(k, k') = Q_c(k, k') + Q_{ph}(k, k')$ . The first term  $Q_c$  corresponds to pure Coulomb effects. The calculation of the expressions for  $Q_c$  and  $Q_{ph}$  are given step by step. The author thanks N. N. Bogolyubov and V. V. Tolmachev for useful discussions. There are 5 references, 3 of which are Soviet

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On the Equation of Compensation in the Theory of  
Superconductivity

SOV/56-36-2-39/63

ASSOCIATION: Matematicheskii institut im. V. A. Steklova Akademii nauk SSSR  
(Mathematical Institute imeni V. A. Steklov of the Academy  
of Sciences, USSR)

SUBMITTED: September 1, 1958

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SOV/56-37-1-20/64

24(3)

AUTHOR:

Shirkov, D. V.

TITLE:

On the Consideration of Coulomb Effects in the Theory of Superconductivity (K uchetu kulonovskikh effektov v teorii sverkhprovodimosti)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 1(7), pp 179-186 (USSR)

ABSTRACT:

The equation for the compensation of the dangerous electron diagrams is put into a symmetric form by transition from the energy operator to the S-matrix; it is expressed by an ordinary Green function. The first part deals with the symmetric equation of compensation. The equation for the compensation of the dangerous electron diagrams in the theory of superconductivity (according to formula (5.19) in the book by N. N. Bogolyubov, V. V. Tolmachev, and D. V. Shirkov) can be represented in the form

$$\int_{-\infty}^0 \left\langle \frac{\delta^2 R}{\delta a_{k1}^+(t) \delta a_{k0}^+(t')} \right\rangle_c e^{i\tilde{\epsilon}(k)(t+t')} dt dt' = 0,$$

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SOV/56-37-1-28/64

On the Consideration of Coulomb Effects in the Theory of Superconductivity

$R = H_{int} T(\exp \left\{ -i \int_{-\infty}^0 H_{int}(t) dt \right\}) = H_{int} S_{-\infty}^0$  denoting the energy operator.  $\alpha_{k1}^+$ ,  $\alpha_{k0}^+$  denote the operators of the generation of quasi-electrons,  $\tilde{\epsilon}(k)$  the energy of the one-fermion excitations with respect to the Fermi surface. The index "o" denotes the average of the strongly bound diagrams. At small  $\tilde{\epsilon}(k)$  (i.e. in a small surrounding of the Fermi surface), the above equation can be replaced by

$i \int_{-\infty}^{\infty} \left\langle \frac{\delta^2 S}{\delta \alpha_{k1}^+(0) \delta \alpha_{k0}^+(t)} \right\rangle_c e^{-i \tilde{\epsilon}(k) |t|} dt = 0$ , and this can be put into the form  $2 \xi(k) u_k v_k = (u_k^2 - v_k^2) \sum_{k'} u_{k'} v_{k'} Q(k, k')$ . In the range of infrared Coulomb singularity, the expression  $\Lambda(k, k'; q) = \frac{1}{\sqrt{2v}} \left\{ 1 - \frac{v(q)F(q)}{2} \sum_s \int_{-\infty}^{\infty} dt \Psi_{s,q}(t) \right\}$  is assumed

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to hold at  $q^2 \sim 0$  for the vertex function. The second part

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*On the Consideration of Coulomb Effects in the Theory of Superconductivity*

deals with the problem of summation of the Coulomb singularities. An important advantage of the method of renormalization of the group is its regularity. The first approximation of the method of the renormalization group leads to formulas which agree with the results of summation of the principal diagrams and with the formulas of the method of the approximate second quantization. The results of higher approximations of the method of the renormalization group may be of interest for the investigation of the problem of extension of the range of applicability of the approximation of a strongly compressed electron gas. The third part deals with the renormalization group in the problem of Coulomb interaction of electrons. The applicability of the method of the renormalization group in the problem of Coulomb interaction of electrons is based on the grouplike nature of the finite multiplicative transformation of the basic quantities: the Green function  $G$  for one electron, the Green function  $\Gamma$  for 2 electrons, and the non-dimensional parameter  $r$  of Coulomb interaction. The sense of this transformation  $G \rightarrow G' = z_2 G$ ,  $\Gamma \rightarrow \Gamma' = z_1 \Gamma$ ,  $r \rightarrow r' = z_1 z_2^{-2} r$  lies in the fact that the totality of the quantities

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SOV/56-37-1-28/64

On the Consideration of Coulomb Effects in the Theory of Superconductivity

$(G', \Gamma', r')$  describes the same physical concept as the triplet  $(G, \Gamma, r)$ . If the method of the renormalization group is used, Lee's differential equations are employed. The author then passes over to the symmetric momentum-energy representation of the electron operators. Formulas for the chronological pair formation are indicated. The infrared asymptotic behavior of the vertex function is then calculated. In the lowest approximation, the well-known formula of Coulomb screening is obtained. The method of renormalization group offers a method of improving the approximation properties of the ordinary perturbation theory. There are 12 references, 10 of which are Soviet.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy  
(Joint Institute of Nuclear Research)

SUBMITTED: January 29, 1959

Card 4/4

24(2)

SOV/56-37-3-33/62

AUTHORS:

Bogolyubov, N. N., Logunov, A. A., Shirkov, D. V.

TITLE:

The Method of Dispersion Relations and the Perturbation Theory

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,  
Vol 37, Nr 3(9), pp 805-815 (USSR)

ABSTRACT:

The present paper is in close relationship to a paper by Redmond (Ref 1), in which expressions are derived for the Green function, which correspond to the perturbation theory and, at the same time, contain no known logarithmic singularities. In the introduction Redmond's method is described, and on the basis of the example of the Green boson- and meson functions the setting up of these expressions and the elimination of non-physical poles is discussed. The method employed by the authors is discussed on the basis of the elimination of "logarithmic" poles from the Green photon function. In contrast to Redmond's method, which is based upon the interrelation of the spectral representations for the Green function and for the polarization operator, the authors proceed from the principle of summing the information deduced from the perturbation theory under the sign of the Källén-Lehmann spectral integral.

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2. Method of Dispersion Relations and the Perturbation Theory

If the contributions from the "main logarithmic diagrams" are summated in this manner, expressions are obtained for the photon propagation function in quantum electrodynamics and for the meson propagation function in the theory of charge symmetry; these expressions have all essential properties of Redmond's result: Regular analytical behavior in the complex plane of the momentum variable  $p^2$ , and a singularity with respect to the variable  $e^2$  (square of the charge) at the point  $e^2 = 0$ . Whereas, however, Redmond's result yields only the lowest order in the perturbation theory, the expressions of the present paper correspond to expansion terms in perturbation theory in the range of large  $p^2$  of arbitrary order. Consideration of the lowest logarithmic terms shows that the range of applicability of the new formulas is the same as in the older formulas which have logarithmic singularities. For the occurrence of a logarithmic pole the following causes are determined: Either the initial Lagrangian is not physical, i.e. its function system does not satisfy the demands of the spectrum, or the approximation meth-

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The Method of Dispersion Relations and the Perturbation Theory

od is not advantageously chosen. The reduction of the expressions found to a renormalization-invariant form is demonstrated in part 4 of this paper on the basis of the example of Green's photon function, and in part 5 a possibility of applying the summation method within the framework of non-renormalizable theories is discussed (on the basis of the example of the nonlinear fermion theory). The results obtained by this paper are summarized, and the authors thank Professor D. I. Blokhintsev, B. V. Medvedev, and M. K. Polivanov for discussions. There are 13 references, 5 of which are Soviet.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: April 17, 1959

Card 3/3

YEFRIMOV, A.V.; MESHCHERYAKOV, V.A.; SHIRKOV, D.V.

Pion-nucleon scattering at low energies. Part 1. Zhur. eksp. i  
teor. fiz. 39 no.2:438-449 Ag '60. (MIRA 13:9)

1. Ob'yedinennyy institut yadernykh issledovaniy.  
(Nucleons--Scattering)

S/056/60/039/004/037/048  
B006/B056

24.6900

AUTHORS:

Yefremov, A. V., Meshcheryakov, V. A., Shirkov, D. V.

TITLE:

Pion-Nucleon Scattering at Low Energies. II

PERIODICAL:

<sup>79</sup>  
Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,  
Vol. 39, No. 4(10), pp. 1099 - 1105

TEXT: Following part I (Ref. 1) of the paper, an integral equation for the phase shift  $\alpha_{33}$  is here derived, and, besides, expressions for other phase shifts which involve  $\pi\pi$ -scattering phase shifts  $\delta_0$  and  $\delta_1$  are obtained. It is found that the dispersion relations in pion-nucleon backward scattering play an essential part, and that the phase shift  $\delta_0$  influences considerably the  $\pi N$ -scattering. The scattering length and the phase shift  $\delta_0$  are estimated by considering small phase shifts near the  $\pi N$ -scattering threshold. Proceeding from the double spectral representation by Mandelstam, the system of integral equations for the partial waves of pion-nucleon scattering is obtained. In the derivation the dispersion

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84419

Pion-Nucleon Scattering at Low Energies. II

S/056/60/039/004/037/048  
B006/B056

relations play an important part. As there are no prospects of being able to give a rigorous proof of Mandelstam's representation, an investigation of the possibility of a rigorous proof of dispersion relations for backward scattering is of interest. It is shown that into the expression for the partial waves of  $\pi N$ -scattering, the s-phase shift  $\delta_0$  of  $\pi\pi$ -scattering

enters with a large factor. Therefore, it is possible, in spite of the approximative character of the calculations and the considerable experimental errors, to determine sign and order of magnitude of the scattering length only on the basis of an investigation of the small p-waves of  $\pi N$ -scattering near the threshold. The authors assume that a more exact calculation of the s- and p-waves in the energy range from 100 to 200 Mev might also furnish data on the p-wave of  $\pi\pi$ -scattering. The results obtained agree with those of Ref. 9, but not with those of Ref. 10. These contradictions are finally briefly discussed. The authors thank Professor Chzhu Khun-yuan' for discussions. There are 1 figure and 10 references: 4 Soviet, 4 US, and 1 CERN.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint  
Institute of Nuclear Research)

SUBMITTED: May 31, 1960  
Card 2/2

SEREBRYAKOV, V.V.; SHIRKOV, D.V.; KOBKOVA, V.I., red.

[Properties of resonance solutions to equations of pion-  
pion scattering] Svoistva rezonansnykh reshenii pion-  
pionnogo rasseianiia (TF-4). Novosibirsk, Akad. nauk SSSR,  
Sibirskoe otd-nie In-t matemat. i vychislitel'nym tsentrom,  
1961. 6 p. (MIRA 15:7)  
(Integral equations) (Mesons—Scattering)

YEFREMOV, A.V.; SHIRKOV, D.V.

Highest partial waves in the low energy approximation.  
Dubna, Ob"edinennyi in-t iadernykh issledovani, 1961. 8 p.  
(No subject heading)

SHIRKOV, D.V.; KOBKOVA, V.I., red.

[Dispersion theories of low-energy scattering (TF-2)] Dispersionnye teorii nizkoenergeticheskogo rasseianiia (TF-2). Novosibirsk, Akad. nauk SSSR, In-t matem. s Vychislitel'nym tsentrom, 1961. 10 p. (MIRA 15:12)

(Scattering (Physics))

SEREBIYAKOV, V.V.; SHIRKOV, D.V.; KOVKOVA, V.I., red.

[Some resonance solutions to equations of low-energy pion-pion scattering] Nekotorye rezonansnye reshenia uravnenii nizkoenergeticheskogo pion-pionnogo rasselaniia (TF-3). Novosibirsk, Akad. nauk SSSR, Sibirskoe otd-nie In-t matem.s vychislitel'nym tsentrom, 1961. 24 p. (MIRA 15:7)  
(Integral equations) (Mesons—Scattering)

YEFREMOV, A.V.; SHIRKOV, D.V.; TSU, H.Y.

The pion-pion scattering at low energy. Dubna, Ob"edinennyi in-t  
iadernykh issledovani, 1961. 26 p. (MIRA 14:11)

1. On leave of absence from Institute for Mathematics, Siberian  
Branch, AN USSR, Novosibirsk 72 (for Shirkov).  
(No subject heading)

SMIRNOV, D. V.

(24)

PHASE I BOOK EXPLOITATION

SOI/5982

International Conference on High-Energy Physics. 9th, Kiev, 1959.

Devjataya mezhdunarodnaya konferentsiya po fizike vysokikh energiy, Kiev 15-25 iyulya 1959 g. (Ninth International Conference on High-Energy Physics. Kiev, July 15-25, 1959), Moscow, 1961. 739 p. 2,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Mezhdunarodnyy Soyuz khimii i prikladnoy fiziki.

Contributors not mentioned.

PURPOSE: This book is intended for nuclear physicists.

COVERAGE: The collection contains 50 scientific articles presented at the 9th International Conference on High-Energy Physics, held in Kiev from 15 to 25 July 1959. The articles presented relate mainly to the progress in nuclear physics achieved in 1959. Subjects discussed are the production of

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1. With Introduction 1. Contents of (1.1.)

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including, their relations, with and among institutions, institutions, and their country. The publication, and the other, institutions can play in the virtual articles.

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Ninth International Conference (Cont.)

807/5982

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Card 5/8

14/107

S/058/62/000/005/018/119  
A001/A101

AUTHORS: Efremov, A. V., Shirkov, D. V.

TITLE: The pion-pion scattering at low energies

PERIODICAL: Referativnyy zhurnal, Fizika, no. 5, 1962, 41, abstract 5A358  
("Scientia sinica", 1961, v. 10, no. 7, 812-836, English) ✓

TEXT: The authors write down an integral equation for amplitude of  $\pi\pi$ -scattering taking into account in derivation only partial amplitudes with orbital moments  $l = 0, 1$  (the latter can be expressed in terms of forward scattering). Closed integral equations for partial amplitudes of scattering of charged pions with  $l = 0, 1$  can be obtained by using dispersion relations for these amplitudes, relations of crossing-symmetry and unitarity. For neutral pions, similar equations determine the amplitude as an R-function. There is no such a simple picture for charged pions, but it is possible to construct a generalized R-function out of amplitudes  $A_l$  ( $l = 0, 1$ ) and thereby to obtain a set of results with regard to the number of zeroes and resonances in  $A_l$  amplitudes. The authors investigate asymptotic behavior of  $A_l$  amplitudes at high energies. It turns out that 3 types of amplitude behavior exist at high energies:

Card 1/2

The pion-pion scattering at low energies

S/058/62/000/005/018/119  
A001/A101

Rel.  $\sim d_i/\ln \omega$ ,  $e_i/\omega$  and  $f_i/\omega^2$ , where  $d_i$ ,  $e_i$ , and  $f_i$  are constants. For small values of "coupling constant"  $\lambda$ , an adiabatic solution has been found by an approximate method by the authors.

Yu. Simonov

[Abstracter's note: Complete translation]

Card 2/2

YEFREMOV, A.V.; SEREBRYAKOV, V.V.; SHIRKOV, D.V.; SARANTSEVA, V.R.,  
tekhn. red.

Low-energy pion-pion scattering. Dubna, Ob"edinennyi in-t iader-  
nykh issledovani, 1962. 8 p.

1. Institute for Mathematics, Siberian Branch U.S.S.R. Academy of  
Sicences, Novosibirsk (for Shirkov).  
(No subject heading)

*SHIRKOV, D.V.*  
SHIRKOV, D. V., G. M. ZIL'BERMAN, V. V., and L. D. LITVIN, P. V.

"Pion-Pion Scattering of Low Energies"

report presented at the Intl. Conference on High Energy Physics, Geneva,  
4-11 July 1962

Joint Institute for Nuclear Research  
Lab. of Theoretical Physics

FEDYANIK, V.K. [translator]; KHOZYAINOV, V.T. [translator];  
MEDVEDEV, B.V., red.; SHIRKOV, D.V., red.; LIVSHITS,  
B.L., red.

[What do physicists think about] Nad chem dumaiut fiziki.  
Pod red. B.V. Medvedeva i D.V. Shirkova. Moskva, Fizmatgiz.  
No. 1. [Nuclear physics] Fizika atomnogo iadra. 1962. 99 p.  
Translated from the English. (MIRA 17:6)

S/056/62/042/002/045/055  
B108/B138

AUTHORS: Serebryakov, V. V., Shirkov, D. V.

TITLE: Some resonance solutions of the equations for low energy pion-pion scattering

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 2, 1962, 610 - 621

TEXT: Solutions of the linearly decreasing branch ( $\text{Re}A_i(z) \approx l_i c/z$ ) of the equations

$$A_i(z) = \frac{1}{\pi} \int_1^{\infty} dz' \left\{ \frac{\text{Im} A_i(z')}{z' - z} + \sum_k \frac{b_{ik} \text{Im} A_k(z')}{z' + z} \right\} \quad (1.1)$$

( $i = 0, 1, 2$ ).

for low-energy pion-pion scattering are considered for the limiting case of resonance ( $\lambda \rightarrow 0$ ).  $c$  is an arbitrary coefficient.  $A_0 = A_0^0$ ,  $A_1 = A_1^1$ ,  $A_2 = A_2^2$ ,  $z = 2v + 1 = 2q^2/\mu^2 + 1$ ;  $b_{ik} = \delta_{ik} + l_i n_k$ ;  $l_0 = -1/3$ ;  $l_1 = -1/18$ ;  $l_2 = 1/6$ ;  $n_0 = 2$ ;  $n_1 = 9$ ;  $n_2 = -5$ . In solutions which for  $z > 1$  have the

Cont 1/4

Some resonance solutions of the ...

S/056/62/042/002/045/055  
B108/B138

$$A_l(z) = N_l(z)/D_l(z), \quad (4.1)$$

$$N_l(z) = A_l(0) + \frac{z}{\pi} \int_{-\infty}^{-1} \frac{\text{Im } A_l(z') D_l(z')}{z'(z'-z)} dz', \quad (4.2)$$

$$D_l(z) = 1 - zg_l - \frac{z}{\pi} \int_1^{\infty} \frac{K(z') N_l(z')}{z'(z'-z)} dz'. \quad (4.3)$$

A connection is established between solutions with power asymptotic and solutions with logarithmic asymptotic expressions. It is shown that the exponential branches are limiting cases of logarithmic branches when the CDD-type zeros (L. Castillejo, R. Dalitz, F. Dyson. Phys. Rev., 101, 543, 1956) shifts to infinity. Experimental data on the width of the p-resonance can be used to determine the role of high-energy contributions in the low-energy region and to give information on the energy dependence of the phase  $\delta_0^0$ . Chu Hung-yüan, A. V. Yefremov, and I. F. Ginzburg are thanked for discussions. There are 4 figures, 2 tables, and 18 references: 5 Soviet and 13 non-Soviet. The five most recent references to English-language publications read as follows: J. Anderson et al. Phys. Rev. Lett., 6, 365, 1961; D. Stonehill et al. Phys. Rev. Lett., 6, 624, 1961.



37885

S/056/62/042/005/032/050

B102/B138

24670

AUTHORS: Yefremov, A. V., Shirkov, D. V.

TITLE: Higher partial waves in low-energy  $\pi\pi$ -scattering

ABSTRACT: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 3, 1962, 1344-1353

NOTE: A. J. Barker (Nucl. Phys., 29, 318, 1962) and C. Lovelace (Nuovo Cim., 22, 102, 1961) have studied the correspondence between the equations of the  $\pi\pi$ -scattering partial waves for low energies obtained with differential (Nucl. Phys. 22, 202, 1960; Scientia Sinica, 10, 812, 1961) and integral methods (G. Chew, S. Mandelstam, Phys. Rev. 119, 467, 1960). Unclear formulations in these studies have been the cause of a new and detailed investigation into the problem of the influence of higher partial waves in the differential method and a comparison with the Chew-Mandelstam method. Also the problem of taking the highest number (including an infinite one) into account is discussed. For neutral  $\pi\pi$ -scattering the asymptotic behavior of the amplitude is given by  $\text{Re } A_0(\nu) \rightarrow \pi b / \ln \nu$ , where  $b = 1/2$ ; this relation is not changed when higher partial waves in the

Card 1/2

S/020/63/148/004/016/025  
B102/B186

AUTHOR: Shirkov, D. V., Corresponding Member AS USSR

TITLE: Invariant charges and Regge asymptotic behavior

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 4, 1963, 814-817

TEXT: Problems of asymptotic ultraviolet behavior of the Green functions in quantum field theory, renormalization invariance, and analyticity are discussed. Special attention is paid to the logarithmic poles that arise when the method of the renormalization groups is combined with analyticity properties. In the equality  $\lim_{k^2 \rightarrow \infty} e^2 d(k^2) e^{2Z_3^{-1}} = 3\pi$  which holds in quantum electrodynamics (the invariant charge coincides with the photon Green function), the quantity  $e^{2Z_3^{-1}}$  arises which remains finite in any finite order. This property is designated as finiteness of the asymptotic value of the invariant charge. The studies made by Ginzburg and Shirkov (Nauchn. dokl. vyssh. shkoly, ser. fiz. matem., no. 2, 143, 1958) on the properties of the scattering amplitude are accomplished by means of a rule for combining the properties of renormalization invariance and



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Card 1/2

Mathematics  
branch of the Academy of

- 21, 1962

L 27602-66 EWT(1) IJP(c) GG

ACC NR: AP6018401

SOURCE CODE: UR/0020/65/162/001/0043/0045

AUTHOR: Achasov, N. N.; Rumer, Yu. B.; Chernyak, V. L.; Shirkov, D. V. (Corresponding member AN SSSR) 45  
B

ORG: Institute of Mathematics, Siberian Section, AN SSSR (Institut matematiki Sibirskogo otdeleniya AN SSSR)

TITLE: Formal dynamic model of unitary symmetry

SOURCE: AN SSSR. Doklady, v. 162, no. 1, 1965, 43-45

TOPIC TAGS: mathematic model, quantum mechanics

ABSTRACT: The purpose of the article is to construct a quantum-mechanical model, the degeneracy of whose levels will have a one-to-one correspondence with all representations of group  $SU(3)$ , each representation occurring only once. The model should possess not less than five degrees of freedom in accordance with the number of quantum numbers effecting the classification of states in group  $SU(3)$  ( $p, q, Q, Y, T$ ). The authors outline the method by which they obtained a spectrum with terms having a one-to-one correspondence with representations of group  $SU(3)$ : that is to say, corresponding to each representation  $D(p, q)$  of group  $SU(3)$  there is a term  $\omega_{pq}$  with degeneracy the multiplicity of which equals  $M(p, q) = (p + 1)(q + 1)(p + q + 2)/2$ . The authors conclude that the adduced construction should be regarded as a certain formal model of unitary symmetry. The authors thank V. V. Serebryakov for the useful discussions. Orig. art. has: 6 formulas. [JPRS]

SUB CODE: 20, 12 / SUBM DATE: 15Jan65 / ORIG REF: 002

Card 1/1

L 2213-66 EWT(d) IJP(c)

ACCESSION NR: AP5019250

UR/0056/65/049/001/0335/0344

AUTHOR: Ginzburg, I. F.; Shirkov, D. V.

TITLE: The renormalization group and the ultraviolet asymptotic limit of scattering

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 1, 1965, 335-344

TOPIC TAGS: scattering amplitude, uv spectrum, Green function, group theory

ABSTRACT: This paper contains a concise survey of the basic points of the renormalization-group method and a detailed analysis of the possibilities of this method in problems of ultraviolet asymptotics. The foundations of the renormalization-group method are briefly outlined. The general solutions of the functional equations derived by L. V. Ovsyannikov (DAN SSSR v. 109, 1112, 1956) are written out and are used as the basis for finding the high energy-asymptotic behavior of the scattering amplitude ( $f$ ). If the mass variable drops out at high energies, then  $f$  is a function of one argument if the scattering angle is fixed and a function of two arguments if the momentum transfer is fixed. In the former case the renormalization-group method gives a better asymptotic than ordinary perturbation theory, but in the latter case it does not. The sum of the main loga-

Card 1/2

L 2213-66

ACCESSION NR: AP5019250

12  
rithmic terms in the symmetric charged pion theory is found. A special hypothesis is formulated, which leads to an asymptotic expression of the quasi-Regge type for both the elastic and the inelastic amplitudes. "We thank I. Todorov for writing the Appendix and A. Logunov for providing the initiative for the work. One of us (I. G.) also thanks D. Stel'makh." Orig. art. has: 1 figure and 38 formulas.

ASSOCIATION: Institut matematiki i vychislitel'nykh tsentrov Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Mathematics with Computation Center, Siberian Department, Academy of Sciences, SSSR)

SUBMITTED: 27Feb65

ENCL: 00

SUB CODE: NP

NR REF SOV: 015

OTHER: 004

Card 2/2

DP

L 02124-67 EWT(1)  
ACC NR: AP6035996

SOURCE CODE: UR/0367/66/003/006/1149/1153

AUTHOR: Shirkov, D. V.

ORG: Institute of Mathematics, Siberian Branch, AN SSSR (Institut matematiki sibirskogo otdeleniya AN SSSR)

TITLE: Solvable model for the forward scattering amplitude

SOURCE: Yadernaya fizika, v. 3, no. 6, 1966, 1149-1153

TOPIC TAGS: particle scatter, meson, pion

ABSTRACT: A model is suggested to describe the forward scattering of spinless particles. The unitarity condition in the model ensures a correct description of the low-energy region near to the threshold and also of the high-energy region if the total cross-section tends to a constant. For neutral mesons the model allows an exact solution, the comparison of which with the low-energy elastic model makes it possible to draw a number of important conclusions. In the real case of charged pions the model gives a system of equations that can be solved by numerical methods. The author thanks A. Martin for the fruitful talk stimulating this research, and also V. V. Serebryakov for the discussions of the results. Orig. art. has: 4 formulas and 1 table.  
[JPRS]

SUB CODE: 20 / SUBM DATE: 27 Oct 65 / ORIG REF: 002 / OTH REF: 003

Card 1/1 1/1

SHIRKOV, Ivan Pigasovich

SHIRKOV, Ivan Pigasovich, laureat Stalinskoy premii, instruktor kamennykh  
rabot; ISLANKINA, T.F., redaktor; ISLENT'YEVA, P.G., tekhnicheskii  
redaktor

[My experience in transporting bricks in "packages"] Moi opyt  
perevozki kirpicha paketami. Moskva, Izd-vo "Znanie," 1954. 22 p.  
(Vsesoiuznoe obshchestvo po rasprostraneniю politicheskikh i  
nauchnykh znaniy, Ser. 4, no.22) (MLRA 7:9)  
(Bricks—Transportation)

SHIRKOV, I. P.

USSR/Engineering - Transportation

Card 1/1 : Pub. 71 - 3/17

Authors : Shirkov, I. P.

Title : Transporting brick piles on platform carts and trays

Periodical : Moch. trud. rab. 5, 11-15, July 1954

Abstract : Methods for transporting brick piles to and from brick kilns are described. Dimensions and specifications for platform carts and trays are given, together with diagrams and illustrations depicting the individual equipment and its operation.

Institution : .....

Submitted : .....



SHIRKOV, I.P., laureat Stalinskoy premii.

Moving bricks by stacking on bottom plates. Gor. khoz. Mosk. 28  
no. 6:32-34 Jo '54. (MLRA 7:7)

1. Deputat Verkhovnogo Soveta SSSR.  
(Bricks--Transportation)

SHIRKOV, I.P., laureat Stalinskoy premii

Containerless method of transporting bricks. Rats. i izobr.predl.  
v stroi. no.109:3-13 '55. (MLRA 8:12)  
(Bricks--Transportation)

SHIRKOV, I.

Remove bureaucratic obstacles from the innovator's path. Sev.  
profsoyuzy 4 no.3:40-42 Mr '56. (MLRA 9:7)

1. Kamenshchik, delegat XX s"yezda Kommunisticheskoy partii  
Sovetskogo Soyusa.  
(Efficiency, Industrial)

KISLITSYN, S.I.; SHIRKOV, I.P.; VENGEROVSKIY, V.A.; FEDOROV, D.F.;  
VAZHNOV, B.N.; TRUNTSEV, D.S.

Rostrum of periodical's readers, inventors, efficiency promoters,  
and innovators at readers' conference in Moscow. Izobr. v SSSR  
2 no.9:37 S '57. (MIRA 10:10)

1.Deputat Verkhovnogo Soveta SSSR (for Shirkov). 2.Zavod "Serp i  
molot" (for Fedorov, Truntsev) 3.Byuro sodeystviya ratsionalizatsii  
i izobretatel'stvu Nauchno-issledovatel'skogo instituta Drevmash  
(for Vazhnov).

(Moscow--Inventions)

(Moscow--Suggestion systems)

SHIRKOV, I., laureat Stalinskoy premii.

A builder's notes. Vop.ekon. no.10:169-173 O '57. (MIRA 10:12)

1. Instruktor peredovykh metodov truda Nauchno-issledovatel'skogo  
sektora Glavmosstroya.  
(Bricklayers)

TOKAREV, F.V., izobretatel', Geroy Sotsialisticheskogo Truda; SMIRNOV, I.V., izobretatel' v oblasti stroymaterialov; POKROVSKIY, G.I., professor, do'ktor tekhnicheskikh nauk; SHIRKOV, I.P., novator stroitel'noy industrii; CHIKIREV, N.S., novator; KOTOVA, S.A., novator, brigadir pryadil'shchits; LOGIN, M.I., izobretatel', inzhener; SLIVOCHKIN, F.P., ratsionalizator; MERKULOV, I.A., izobretatel', konstruktor dvigateley; KOSMATOV, N.V., izobretatel' v oblasti kino; KHLIBTSSEVICH, Yu.S., izobretatel', kandidat tekhnicheskikh nauk; SHCHADILOV, V.I., ratsionalizator-naladchik.

"Inventor" has a proud ring to it! Tekh. mol. 25 no.3:1-3 Mr '57.  
(MIRA 10:6)

1. Deputat Verkhovnogo Soveta SSSR (for Shirkov). 2. Nachal'nik tsekha zavoda imeni Sergo Ordzhonikidze (for Chikirev). 3. Fabrika imeni Kalinina (for Kotova). 4. Termitnostrelochnyy savod (for Login). 5. Zavod "Kauchuk" (for Slivochkin).  
(Inventions)

SHIRKOV, I.P., laureat Stalinskoy premii; FINKELITE, F.I., inzh.; KARDO-  
-SYSOYEV, F.N., inzh., nauchnyy red.; TYAPKIN, B.G., red.izd-va;  
KRYUGER, Yu.V., red.izd-va; BOBOVNEV, E.K., tekhn.red.

[Album of drawings of equipment and devices for mechanized  
transportation of bricks in packets] Al'bom chertezhei oboru-  
dovaniia i prisposoblenii dlia kompleksnoi mekhanizatsii dostavki  
kirpicha paketami. Moskva, Gos. izd-vo lit-ry po stroit., arkhitekt.  
i stroit. materialam, 1958. 117 p. (MIRA 12:1)  
(Bricks--Transportation)

SHIRKOV, I., kamenshchik, laureat Stalinskoy premii

Give help and support to innovators and inventors. Sov. profsciuzy  
7 no.11:21-23 Ja '59. (MIRA 12:9)  
(Inventions, Employees')



SHIRKOV, S.K.

15

Application of Solid Electrodes for Polarographic Analysis. (In Russian.) S. K. Shirkov. *Zavodskaya Laboratoriya* (Factory Laboratory), v. 14, Nov. 1948, p. 1300-1306.

The possibility of using the above was theoretically investigated. Technique and sphere of application are indicated as compared with the commonly used mercury-drop electrodes. Data from a typical determination are charted.

ASD SLD DETALLOPICAL LITERATURE CLASSIFICATION

EXPERIMENTAL STUDIES OF  $\alpha$  DECAY OF  $^{210}\text{Po}$

SHIRKOVA, A. P.

SHIRKOVA, A. P. - "The Biology and Significance to the Fish Economy of the Perch of Lake Ladoga and the Pskov-Chudskoye Reservoir." Leningrad State Pedagogical Inst imeni A. I. Gertsen. Chair of Zoology and Darwinism. Leningrad, 1955. (Dissertation for the Degree of Candidate in Biological Sciences)

So; Knizhnaya Letopis' No 3, 1956

SHIRKOVA, A.K.

Biological heterogeneity of the Lake Peipus lavaret in connection with its acclimatization in other bodies of water [with summary in English]. Zool. zhurn. 36 no.6:951-953 Je '57. (MLBA 10:8)

1. Laboratoriya ikhtiologii Vsesoyuznogo nauchno-issledovatel'skogo instituta ozernogo i rechnogo rybnogo khozyaystva.  
(Peipus, Lake--Whitefishes)

SHIRKOVA, G. I.

PA 77T71

USSR/Medicine - Reflexes, Motor  
Chemistry - Phenamine

Apr 1948

"The Effect of Phenamine on the Motor Reflexes of  
Makak Monkeys," L. G. Voronin and G. I. Shirkova,  
Sukhumi Biol Sta, Acad Med Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LX, No 3

Studies to determine stimulating effect of phenamine  
on motor reflexes of subject monkeys. Submitted by  
Acad L. A. Orbeli 27 Feb 1948.

77T71



SHIRKOVA, G.I.

Motor conditioned reflexes on the simultaneous complex of stimuli  
in lower monkeys. Zh. vyssheĭ nerv. deiat. 1 no. 5:716-721 Sept-  
Oct 1951. (GLML 23:3)

1. Sukhumi Medico-Biological Station of the Academy of Medical  
Sciences USSR.

SHIRKOVA, G.I.

Modifications of the higher nervous function in aged Rhesus monkeys.  
Zhur. vys. nerv. deiat. 4 no.2:194-205 Mr-Apr '54. (MLRA 7:10)

1. Sukhumskaya mediko-biologicheskaya stantsiya AMN SSSR  
(CENTRAL NERVOUS SYSTEM, function tests,  
higher nervous funct. tests in aged monkeys)  
(REFLEX, CONDITIONED,  
in higher nervous funct. tests in aged monkeys)  
(AGED, physiology,  
higher nervous funct. tests in aged monkeys)  
(MONKEYS,  
higher nervous funct. tests in aged monkeys)



SHIRKOVA, G.I.

Conditioned motor reactions to complex (chain) stimuli in white rats.  
Trudy Inst.vys.nerv.deiat. Ser.fiziol. 1:78-95 '55. (MLRA 9:8)

1. Iz laboratorii dvigatel'nykh uslovykh refleksov, zaveduyushchiy  
G.V.Skipin.

(CONDITIONED RESPONSE)

SHIRKOVA, G.I.

Possibility of carrying out experiments on conditioned reflexes with animals twice a day. Trudy Inst.vys.nerv.delat. Ser.fiziol. 1:159-166 '55. (MLBA 9:8)

1. Iz laboratorii dvigatel'nykh uslovnnykh refleksov, zaveduyushchiy G.V.Skipin.

(CONDITIONED RESPONSE) (PSYCHOLOGY, PHYSIOLOGICAL)

SHIRKOVA, G.I.

The neural mechanism of certain so-called voluntary movements; study of reactions occurring between signals. Trudy Inst. vys. nerv. deiat. Ser. fiziol. 2:75-89 '56. (MLRA 10:1)

1. Iz laboratorii dvigatel'nykh uslovnykh refleksov, zav. - G.V. Skipin.

(MOVEMENT, PSYCHOLOGY OF)

SHIRKOVA, G.I.

Changes in the higher nervous activity in old age in a monkey  
(Macaca rhesus). Trudy Vses. ob-va fiziol., biokhim. i farm.  
4:115-123 '58. (MIRA 14:2)

1. Laboratoriya vysshey nervnoy deyatel'nosti Sukhumskoy mediko-  
biologicheskoy stantsii AMN SSSR (zav. laboratoriyey prof. L.G.  
Voronin).

(NERVOUS SYSTEM)

SHIRKOVA, G.I.

Some features of the formation of conditioned motor defense reflexes in dogs [with summary in English]. Zhur.vys.nerv.deiat.  
8 no.3:393-402 My-Je '58 (MIRA 11:8)

1. Institut vysshey nervnoy deyatel'nosti AN SSSR.  
(CONDITIONED RESPONSE)

SHIRKOVA, G.I.

The response "to time" in experimental defensive reaction to electricity in dogs [with summary in English]. Biul. eksp. biol. i med. 45 no. 4: 24-30 Ap '58 (MIRA 11:5)

1. Iz Instituta vysshey nervnoy deyatel'nosti (dir. - deystvitel'nyy chlen AMN SSSR A.G. Ivanov-Smolenskiy) AN SSSR, Moskva. Predstavlena deystvitel'nyy chlenom AMN SSSR V.N. Chernigovskim. (REFLEX, CONDITIONED, experimental reflex to time of presentation of stimulus in exper. electrodefensive reaction in dogs (Rus))

SHIRKOVA, G.I.

Conditioned reflex switching in monkeys. Fiziol. zhur. 45 no.5:  
518-526 My '59. (MIRA 12:7)

1. Laboratoriya usloynykh refleksov Instituta vysshey nervnoy dey-  
stel'nosti Akademii nauk SSSR, Moskva.

(REFLEX, CONDITIONED,  
conditioned switch-over in monkeys (Rus))

SHIRKOVA, G.I.

Time as a component of the conditioned stimulus. Trudy Inst.  
vys.nerv.deiat. Ser.fiziol. 4:47-62 '60. (MIRA 13:7)

1. Iz laboratorii dvigatel'nykh uslovykh reflektsov Instituta  
vyshey nervnoy deyatel'nosti AN SSSR. Zaveduyushchiy laborato-  
riyey - G.V. Skipin.  
(CONDITIONED RESPONSE) (TIME PERCEPTION)



SHIRKOVA, G.I.

Differentiation of the duration of a conditioned stimulus.  
Trudy Inst.vys.nerv.deiat. Ser.fiziol. 4:63-72 '60.

(MIRA 13:7)

1. Iz Laboratorii dvigatel'nykh uslovnykh refleksov Instituta  
vysshey nervnoy deyatel'nosti AN SSSR. Zaveduyushchiy laboratorii-  
yey - G.V. Skipin.

(CONDITIONED RESPONSE) (TIME PERCEPTION)

ALEKSANDROVSKAYA, M.M.; SHIRKOVA, G.I.

Morphological and functional changes in the central nervous system  
in old monkeys (*Macaca rhesus*). Trudy Inst. vys. nerv. deiat. Ser.  
fiziol. 5:238-249 '60. (MIRA 13:10)

1. Iz Kabineta morfologii mozga (zav. - M.M. Aleksandrovskaya)  
instituta vysshey nervnoy deyatel'nosti i Sukhumskoy mediko-  
biologicheskoy stantsii AMN SSSR (dir. - L.G. Voronin).  
(NERVOUS SYSTEM) (CONDITIONED RESPONSE)

SHIRKOVA, G.I.; VEREVKINA, G.L.

Conditioned motor chain reflexes in monkeys. Dokl.AN SSSR  
133 no.3:730-733 J1 '60. (MIRA 13:7)  
(CONDITIONED RESPONSE)  
(MONKEYS)

SHIRKOVA, G.I.; VEREVKINA, G.L.

Chain polyeffecter food reflexes to complex stimuli in monkeys.

Trudy Inst. vys. nerv. deiat. Ser. fiziol. 6:181-187 '61.  
(MIRA 14:12)

1. Iz laboratorii upravitel'noy fiziologii vysshey nervnoy deyatel'-  
nosti, zav. - L.G.Voronin.  
(CONDITIONED RESPONSE)

SHIRKOVA, G.I.

Conditioned inhibition and disinhibition of chain polyaffector  
motor reflexes in monkeys. Trudy Inst.vys.nerv.deiat. Ser.fiziol.  
7:231-240 '62. (MIRA 16:2)

(CONDITIONED RESPONSE)

SHIRKOVA, G.I. [deceased]

Physiological mechanisms of the so-called habit transfer. Zh. vyzn. nerv. deyat. 15 no.2:374-380 Apr '65.

1. Kafedra fiziolog i vysshey nervnoy deyatel'nosti Moskovskogo gosudarstvennogo universiteta imeni M.V. Lomonosova.

SHIRKOVSKIY, A. I. (Aspirant)

"The Underground Storage of Gas." Cand Tech Sci, Moscow Order of Labor Red Banner  
Petroleum Inst imeni I. M. Gubkin, 28 Dec 54. (VM, 17 Dec 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational  
Institutions (12)

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*Shirkovskiy A.I.*

PHASE I BOOK EXPLOITATION

313

Smirnov, Aleksandr Sergeyvich, Doctor of Technical Sciences,  
Professor, Shirkovskiy, Arkadiy Iosifovich, Candidate of  
Technical Sciences

Dobycha i transport gaza (Gas Production and Transportation)  
Moscow, Gostoptekhizdat, 1957. 557 p. 5,000 copies printed.

Reviewer: Tolmachev, V. S.; Ed.-in-Charge: Martynova, M. P.;  
Tech. Ed.: Mukhina, E. A.

PURPOSE: The book is intended as a textbook to be used by students  
in petroleum vuzes and departments of polytechnic  
institutes. It can also be used by specialists in the  
field of natural gas production and transportation.

COVERAGE: The author analyses the physical and chemical properties  
of natural gas, and goes into gas dynamics, the exploita-  
tion of gas-condensate reservoirs, and the problems  
involved in the transportation, refining, supply, storage  
and transportation of natural gas and petroleum and  
petroleum products. Dotsent B. M. Rybak, Assistant

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AVAILABLE: Library of Congress

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СНІРЬСЬКИЙ, А      І

Dobycha I transport paza [by] A. S. Smirnov I A. I.  
Shirkovskiy. Moskva, Gostoptekhnizdat, 1957.  
557 p. illus., diagrs., graphs, tables.  
Includes bibliographies.

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SHIRKOVSKIY, A.I.

Analysis of existing solutions for the problem of water flow  
in the exploitation of gas fields. Izv. vys.ucheb. zav.; neft'  
i gaz no. 3:63-71 '58. (MIRA 11:7)

1. Moskovskiy neftyanoy institut im. akad. I.M.Gubkina.  
(Water, Underground)



SHIRKOVSKIY, A.I.

Technical and economic aspects of determining the number of holes,  
volume of buffer gas, power of the compressor station and depth of  
traps for the underground storage of gas; a discussion. Gas.prom.  
no.11:33-38 N.'58. (MIRA 11:11)  
(Gas, Natural--Storage)

SHIRKOYSKIY, Arkadiy Iosifovich; SOLGANIK, G.Ya., vedushchiy red.;  
GANINA, L.V., tekhn.red.

[Underground gas storage; theory, practice, and economics]  
Podzemnoe khranenie gaza; voprosy teorii, praktiki i ekonomiki.  
Moskva, Gos.nauchno-tekhn.isd-vo neft, i gorno-toplivnoi lit-ry,  
1960. 73 p. (MIRA 13:4)  
(Gas, Natural--Storage)

YEROFEYEV, N.S., red.; ZLOTNIKOV, I.M., red.; LESIK, N.P., red.;  
NIKOLAYEVSKIY, N.M., red.; ~~SHIRKOVSKIY, A.I.~~, red.  
SMIRNOVA, N.K., ved. red.; ROZOVA, S., tekhn. red.

[Some problems in the development and operation of gas and  
gas-condensate fields] Nekotorye voprosy razrabotki i eks-  
pluatatsii gazovykh i gazokondensatnykh mestorozhdenii.  
Moskva, 1962. 91 p. (MIRA 16:10)

1. Institut tekhnicheskoy informatsii i ekonomicheskikh is-  
sledovaniy po neftyanoy i gazovoy promyshlennosti.  
(Gas wells) (Condensate oil wells)

[illegible]

Flooding gas with incompressible water in the development of gas condensate fields in water drive. Trudy MINKHIMP no.48:124-137 '64.

Determining the gas saturation factors  $\alpha$  and gas yield factors  $\beta$  of the flooded zone of gas fields. Ibid.:138-160

Technical and economic basis for the basic parameters of a gas supply system with noncompressor gas transportation. Ibid.:186-206 (MIRA 18:3)

SHIRKOVSKIY, A.I.; LATONOV, V.V.; SAKHAROVA, V.K.

Effect of reservoir exploitation conditions on the diameter of  
a producing well (casing string) and the gas transportation  
system. Trudy MINKHIGF no.48:207-217 '64.

(MIRA 18:3)

SHIRMA, G.B., khimik

Method for determining the naphthalene in sewage. Gig. i  
san. 26 no.7:61-64 JI '61. (MIRA 15:6)

1. Iz kafedry kommunal'noy gigiyeny Leningradskogo  
sanitarno-gigiyenicheskogo meditsinskogo instituta.  
(NAPHTHALENE)  
(SEWAGE—ANALYSIS)

SHIRMA, Ye.G.

Myeloma. Zdrav. Belor. 6 no.8:41-45 Ag '60.

(MIRA 13:9)

1. Iz kafedry rentgenologii i radiologii (zaveduyushchiy - prof.  
B.M. Sosina) Belorusskogo instituta usovershenstvovaniye vrachey.  
(MARROW--TUMORS)

SHILMAN, Ya.D.; GOLIKOV, V.N.; GROZNOVA, V.I., red.; SVESHNIKOV, A.A.,  
tekhn. red.

[Principles of the theory of radar signal detection and de-  
termination of their parameters] Osnovy teorii obnaruzhenia  
radiolokatsionnykh signalov i izmereniia ikh parametrov. Mo-  
skva, "Sovetskoe radio," 1963. 277 p. (MIRA 17:2)



DUBROVSKIY, V.G.; SHIRMAEDOV, M.

Effect of the solar eruption of March 23, 1958, on the condition of the ionosphere and on the geomagnetic pole; based on observations made in Ashkhabad. Izv. AN Turk. SSR. no.1:110-112 '59.

(MIRA 12:5)

1. Institut fiziki i geofiziki AN Turkmenskoy SSR.  
(Sun) (Magnetism, Terrestrial—Observations)  
(Ionosphere)

5(1), 9(9)

SOV/165-59-6-1/5715

AUTHOR: Shirmamedov, M.

TITLE: Study of the Absorption of Radio Waves in the Ionosphere on Latitudes of Ashkhabad

PERIODICAL: Izvestiya Akademii nauk Turkmenkoy SSR, 1959, Nr 6, pp 3-12

ABSTRACT: The author describes the results of observations concerning the absorption of radio waves started at Ashkhabad in 1954. Research was based on the measuring of the reflection of radio waves by the ionosphere by means of vertical impulse sounding at a frequency of 2 Mc. The coefficient was measured by a comparison of the amplitudes of the first and second reflections. The article contains experimental data and 4 formulas on the variations in the absorption of radio waves in the ionosphere from 1954 until the end of 1956. The average 24-hour absorption coefficient for April 1956 is shown on Graph 1. The registration in strata  $F_2$  was conducted between 2000 and 0800 hours and in strata E between 0800 and 2000 hours. The seasonal movement of the absorption coefficient (2) and variations of the solar activity in relative Wulf's number (1) is shown on Graph 2. For better understanding a contour chart of the absorption coefficient is given on Graph 3. It is assumed that the

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SOV/165-59-6-1/5-15

Study of the Absorption of Radio Waves in the Ionosphere on Latitudes of Ashkhabad

There are 4 graphs, 2 tables and 13 references, 5 of which are Soviet,  
5 English and 3 French.

ASSOCIATION: Institut fiziki i geofiziki AN Turkmenskoy SSR (Institute of Physics and  
Geophysics AS Turkmenskaya SSR)

SUBMITTED: May 9, 1958



S/169/61/000/011/055/065  
D228/D304

AUTHOR: Shirmamedov, M.

TITLE: The magnitude of the correction for the coefficient of reflection when taking into account small heterogeneities in the ionosphere

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 11, 1961, 2, abstract 11618 (Izv. AN TurkmSSR, Ser. fiz.-tekhn. khim. i geol. n., no. 6, 1960, 30 - 35)

TEXT: The results of the processing of experimental data on measuring the coefficient of reflection from the ionosphere are cited. The processing of the data was made both by the usual method, which disregards the influence of heterogeneities, and by a procedure that takes their influence into account. A polarization transmitting antenna system - consisting of two delta-antennas, situated at an angle of  $90^{\circ}$  to each other, with a plane orientation of north-south and east-west - was used to eliminate the effect of polarization. The antenna is supplied from the transmitter by a feeder line

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